



REMARKS

Reconsideration and allowance of the subject patent application are respectfully requested.

For the Examiner's convenient reference, a complete listing of claims is provided beginning on page 2 of this paper.

Applicant acknowledges with appreciation the indication that claims 19-28 are allowed. Claims 36 and 37 depend from claims 19 and 24, respectively. As such these claims are also believed to be allowable.

Claims 1-18 and 29-44¹ were rejected under 35 U.S.C. Section 103(a) as allegedly being "obvious" over Emerson *et al.* (U.S. Patent No. 5,553,059) in view of Borchering *et al.* (U.S. Patent No. 5,802,143).

Applicant traverses this rejection for the reasons set forth below.

Emerson *et al.* discloses a system for determining where errors have occurred in a transmission path. Specifically, the system determines whether there is an error in lines 16 or lines 18 of local loop 14. A loop back test is performed after network interface unit (NIU) 22 enters a loop back mode and the network based test system 32 transmits a serial stream of bits to the NIU 22 over lines 16. Each bit received by the unit 22 is returned via link 30, which is switched into the circuit by the NIU control circuit, and then transmitted over lines 18 back to the test system 32. There the bit sequence is compared to the

¹ As previously noted, claims 36 and 37 are believed to be allowable because of their dependency from allowed claims.

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sequence that was originally transmitted. To distinguish if the error occurred in the forward path from the test system 32 to the NIU 22 over lines 16 or over lines 18, a pattern generator circuit is activated. When the NIU 22 command detector circuit 34 detects a remote pattern generation command sequence on lines 16, the circuit 36 is invoked. The command contains information about which test pattern is to be generated by the unit 22. The requested test pattern is generated by the NIU 22 and transmitted over lines 18 to the test system 32. There the results are analyzed and determination is made if a transmission error occurred. If transmission errors occur in the NIU loop back test and transmission errors also occur in the NIU pattern generation test, the transmission problem is located in the receive direction of local loop 14 on lines 18. If transmission errors occurred in the NIU loop back test and no error occurred in the NIU pattern generation test, then the transmission problem is located in the transmit direction of local loop 14 on lines 16.

Claim 1 is directed to an apparatus for remotely measuring characteristics of a communications line that includes, among other things, a receiver means for connection to a remote end of a communications line and a sender means for connection to the other end of the communications line. In response to selection of one of a plurality of characteristics of the communications line to be measured, a signal uniquely representing the selected characteristic is generated, and predetermined circuitry is connected across the communications line at the remote end. The signal is sent to the sender means, which includes switching

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means that is controlled to connect predetermined circuitry across a communication line at the other end to enable a selected characteristic of the line to be measured.

Emerson *et al.* does not disclose, among other things, switching predetermined circuitry across a communication line at either end thereof to enable a selected characteristic of the line to be measured as set forth in claim 1. Indeed, Emerson *et al.* does not disclose the measuring of a line characteristic at all. Rather, based on the checking of bit patterns, Emerson *et al.* determines whether a problem exists in a local loop or CSU/DSU and, if the problem is in the local loop, whether the problem is in the transmit or receive direction. No measurements of a line characteristic are described.

The office action references the title and abstract of Emerson *et al.*, as well as col. 1, lines 55-67, col. 2, lines 4-46, col. 3, lines 5-65, col. 4, lines 2-3, 21-67, col. 5, lines 1-67, col. 6, lines 2, 14-67 and col. 7, lines 1-65 in support of Emerson *et al.*'s alleged disclosure of, for example, "generating a signal in response to a selection of one of a plurality of characteristics of the line to be measured" and switching means to connect predetermined circuitry across the line "to enable a selected characteristic of the line to be measured." However, none of these portions of Emerson *et al.* mention or suggest the concept of "measuring" (and Applicant does not find any form of the word "measure" in the referenced portions or elsewhere in Emerson *et al.*) The column 2 portion of Emerson *et al.* speaks of a test "monitor", but this is in the context of generating

test data and examining test results. There is no disclosure of "measuring" in this column 2 portion, particularly of measuring a line characteristic.

In addition, Emerson *et al.* does not describe the use of a receiver means connected to a remote end of a communications line and sender means connected to the other end of the communications line. Emerson describes the use of a network interface unit 22 that transmits data around a loop including two communications lines. Further, Emerson *et al.* does not disclose switching circuitry across the communication line at both the remote end and at the other end. In particular, Emerson *et al.* does not disclose or suggest connecting predetermined circuitry across the communication line at the remote end based on the selection of a characteristic to be measured. Further still, no signal representative of the selective characteristic of the line to be measured is transmitted from a receiver means to a sender means in Emerson *et al.*

The office action alleges that Borchering *et al.* remedies at least some of the deficiencies of Emerson *et al.* In particular, the office action alleges that Borchering *et al.* discloses using a "switching fabric" to sequentially connect predetermined circuitry so that damaged cable pairs may be identified and restored. The office action contends that it would have been obvious at the time of the invention to modify the apparatus disclosed in Emerson *et al.* to include a switching fabric as disclosed by Borchering *et al.* so that sequential messages may be used to switch predetermined circuitry across communication lines to

selectively ground telephone lines, thereby enabling damaged lines to be identified and restored.

Applicant traverses these contentions.

Borchering *et al.* discloses a service restoration system to which proximate and distal ends of damaged cables are connected. Messages including directory numbers (e.g., "708-555-1234") are sent from a LEC switch over the respective distal ends of the damaged cables. Because the messages may utilize either an FSK or an ISDN protocol, the switch fabric sequentially establishes a call path from each distal end cable pair link to FSK and ISDN receivers. Each received message (including the directory number), along with the identity of the cable over which the message came in, is stored in the cable pair identification database.

First, the office action suggests that Borchering *et al.* suggests modifying Emerson *et al.* so that "sequential messages" may be used to switch predetermined circuitry across communication lines to "selectively ground" telephone lines. Applicant does not find the concept of "sequential messages" for "selectively grounding" telephone lines to be disclosed in Borchering *et al.* Borchering *et al.* does mention sequentially establishing a call path from each distal cable pair link to FSK and ISDN receivers (*see, e.g.,* col. 5, lines 18-19), but Applicant finds no disclosure or suggestion of "sequential messages" or "selectively grounding" lines here or elsewhere in Borchering *et al.* Accordingly, Applicant respectfully submits that the disclosure of Borchering *et al.* does not

support the contentions in the office action regarding the motivation for combining Borchering *et al.* with Emerson *et al.*

Second, leaving aside the issue of “sequential messages” and “selective grounding”, Applicant respectfully submits that the Emerson *et al.* and Borchering *et al.* systems are not properly combinable in the manner proposed in the office action. Specifically, Emerson *et al.* relates to testing a line to determine if a problem exists, while Borchering *et al.* relates to fixing a problem that has already been determined to exist. Thus, while Borchering *et al.* might perhaps be incorporated into the Emerson *et al.* system to fix a communication line already determined to be broken, there is no teaching or suggestion in Borchering *et al.* that would have led to a modification of Emerson *et al.*’s scheme for detecting whether communication errors in the local loop of a digital data network are present.

Third, even assuming Emerson *et al.* and Borchering *et al.* were forcedly combined as proposed, the system of claim 1 does not result. As discussed above, the switching fabric of Borchering *et al.* is used to interconnect proximal and distal ends of broken communication cables. As part of this process, FSK and ISDN receivers may be used to detect messages including telephone numbers sent from the LEC switch. Borchering *et al.* discloses no capability of selecting a line characteristic to be measured or of sending a signal indicative of such a characteristic. Borchering *et al.* simply sends a telephone number which, while perhaps unique, is not uniquely indicative of a line characteristic to be

measured and does not result in the connection of circuitry across the line that allows such a characteristic to be measured. Indeed, no measurement is performed or contemplated in Borchering *et al.* based on the telephone number -- the telephone number is stored for later use in connecting the distal end of the cable to the appropriate proximal end. As such, Borchering *et al.* does not remedy the deficiencies of Emerson *et al.* with respect to, for example, measuring a line characteristic.

In addition, there is no predetermined circuitry in Borchering *et al.* that is connected across a communications line at a remote end and also at the other end of the communications line to enable a selected characteristic of the line to be measured. The nominal switching activity of Borchering *et al.* takes place only at one end of a telecommunications line. Moreover, use of the switching fabric enables messages from the LEC switch to be received over a particular line, but the switching fabric does not of itself connect circuitry across a communications line that measures a characteristic of that line.

Consequently, for at least these reasons, the proposed combination of the teachings of Emerson *et al.* and Borchering *et al.* would not have resulted in the features of claim 1.

Claims 2-9 and 34 depend from claim 1 and are likewise believed to be allowable over the proposed Emerson *et al.*-Borchering *et al.* combination.

With respect to claim 9, the office action acknowledges the Emerson *et al.* provides no explicit disclosure of the claimed low frequency signal. The

remaining discussion of this claim in the office action makes reference to Borchering *et al.*, but does not identify any portion thereof that relates to a low frequency signal. Because no proper basis for the rejection of claim 9 is articulated, withdrawal of the rejection of this claim is respectfully requested.

Claim 10 is directed to a method for remotely measuring characteristics of a communications line that includes, among other things, connecting receiver means to a remote end of a communications line and connecting sender means to the other end of the communications line. In response to selection of one of a plurality of characteristics of the communications line to be measured, a signal uniquely representing the selected characteristic is generated, and predetermined circuitry is connected across the communications line at the remote end. The signal is sent to the sender means and switching means is controlled to connect predetermined circuitry across a communication line at the other end to enable a selected characteristic of the line to be measured. The proposed Emerson *et al.*-Borchering *et al.* combination is deficient with respect to claim 10 for the reasons set forth above with respect to claim 1.

Claims 11-18 and 35 depend from claim 10 and are likewise believed to be allowable over the proposed Emerson *et al.*-Borchering *et al.* combination.

Claim 29 is directed to apparatus for remotely measuring characteristics of a communications line that includes a receiver unit connected to one end of the communications line and a sender unit connected to another end of the communications line. The receiver unit includes a signal generator for

generating a signal uniquely representing a characteristic of the communications line, a signal transmitter for transmitting the generated signal to the sender unit, and circuitry that is selectively connected across the communications line based on the characteristic to be measured. The sender unit includes a signal detector for detecting the signal transmitted from the receiver unit, measurement-related circuits, and a switching circuit controlled in accordance with the detected signal to selectively connect at least one of the measurement circuits across the communications line.

The proposed combination of Emerson *et al.* and Borchering *et al.* does not render the subject matter of this claim obvious. For example, as noted above, neither Emerson *et al.* nor Borchering *et al.* discloses or suggests connecting circuitry across a communications line at two ends of the communications line in order to measure a characteristic of the communications line. As such, the combination of the systems disclosed in these documents would not have resulted in the subject matter of claim 29.

Claims 30-33 and 38-43 depend from claim 29 and are likewise believed to be allowable over the proposed Emerson *et al.*-Borchering *et al.* combination.

With respect to claim 32, the office action acknowledges that Emerson *et al.* lacks an explicit description of "line loss." Applicant notes that claim 32 refers to, among other things, "signal loss", but not line loss. Moreover, the remaining discussion of claim 32 repeats the characterization of Borchering *et al.*, but does not mention line loss (or signal loss) and provides no indication of how the

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admitted deficiency of Emerson *et al.* in this regard is remedied. Because no proper basis for the rejection of claim 32 is articulated, withdrawal of the rejection of this claim is respectfully requested.

With respect to claim 39, the office action acknowledges that Emerson *et al.* lacks an explicit description of using numeric values, but the remaining discussion of this claim does not mention numeric values and provides no indication of how this admitted deficiency of Emerson *et al.* is remedied. Because no proper basis for the rejection of claim 39 is articulated, withdrawal of the rejection of this claim is respectfully requested. Claim 43 mentions a display of numeric values and withdrawal of the rejection of this claim is likewise respectfully requested.

Claims 40 and 41 relate to a call preventing circuit. However, while the office action mentions the alleged inherency or obviousness "impedance matching" in connection with these claims, there is no discussion of the claimed call preventing circuit. Additionally, the office action mentions Butler *et al.*'s purported use of "isolating circuitry." However, Butler *et al.* is not relied upon in the rejection of claims 40 and 41. Because no proper basis for the rejection of claims 40 and 41 is articulated, withdrawal of the rejection of these claims is respectfully requested.

Claim 44 is directed to an apparatus for measuring characteristics of a communications line in which circuitry portions for measuring a selecting characteristic are connected across the communications line at two ends thereof.

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Emerson *et al.* and Borchering *et al.* do not disclose measuring a line characteristic as claimed and do not disclose or suggest connecting circuitry portions as claimed to accomplish such measuring. As such, the combination of these documents is likewise deficient in this regard and claim 44 is therefore believed to be allowable.

Applicant submits that the pending claims are in condition for allowance, and action to that end is earnestly solicited. If any issues remain to be resolved, the Examiner is urged to contact the attorney for Applicant at the telephone number listed below.

Respectfully submitted,

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A handwritten signature in cursive script, reading "Michael J. Shea", is written over a horizontal line.

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